

What Is Claimed Is:

1. A method for measuring the heat flux on an object surface, wherein the emission intensity of a temperature-sensitive paint that varies with the temperature of the object surface is chronologically captured and sensed as video information at a high frame rate, and the heat flux in each domain is calculated using the following formula on the basis of temperature history in each of the separate domains on the object surface in a state in which excitation light is incident on the object surface that comprises an arbitrary material and is coated with a temperature-sensitive paint.

$$\dot{q}(t) = 2\sqrt{\frac{\rho c k}{\pi}} \sum_{i=1}^m \frac{T(i) - T(i-1)}{(t_m - t_i)^{1/2} + (t_m - t_{i-1})^{1/2}}$$

2. The method for measuring the heat flux on an object surface according to claim 1, wherein the temperature-sensitive paint comprises any of a rare-earth complex, transition metal complex, polycyclic aromatic compound, porphyrin, and phthalocyanine.

3. The method for measuring the heat flux on an object surface according to claim 1, wherein the captured video data are converted to temperature data on the basis of characteristic information, which is captured by the correlative calibration of temperature and the emission intensity of the temperature-sensitive paint, as a preprocessing routine of a heat flux calculation.

4. The method for measuring the heat flux on an object surface according to claim 2, wherein the captured video data

are converted to temperature data on the basis of characteristic information, which is captured by the correlative calibration of temperature and the emission intensity of the temperature-sensitive paint, as a preprocessing routine of a heat flux calculation.

5. An apparatus for measuring the heat flux on an object surface, comprising:

an excitation light source for irradiating the surface of a measurement object coated with a heat-sensitive paint;

a high-speed imaging apparatus for imaging the measurement object;

means for determining the temperature of each separate domain on the object surface on the basis of characteristic data related to the emission intensity and temperature of the temperature-sensitive paint; and

means for calculating the heat flux in each domain from the temporal variations of temperature in each separate domain.

6. The apparatus for measuring the heat flux on an object surface according to claim 5, comprising means for converting heat flux data calculated for each separate domain to video information in accordance with the position on the surface of the measurement object; and

a function for displaying this image on a display.

7. The apparatus for measuring the heat flux on an object surface according to claim 5, wherein the data for each of the separate domains on the object surface are the

information of a single pixel in the CCDs of the imaging apparatus.

8. The apparatus for measuring the heat flux on an object surface according to claim 7, wherein the data for each of the separate domains on the object surface are the information of a single pixel in the CCDs of the imaging apparatus.